

DISSOLVED HYDROGEN ANALYZER

Abstract of the Disclosure

The present invention provides apparatuses and processes for the measurement of hydrogen in aqueous solution at concentrations as low as about 0.1 nM. The present invention is capable of accurately and reproducibly measuring the concentration of dissolved hydrogen in an aqueous solution that also contains other dissolved gases, such as oxygen, carbon monoxide and sulfur compounds, such as hydrogen sulfide. In a presently preferred embodiment of a hydrogen analyzer 38 of the present invention, water containing dissolved hydrogen is equilibrated with a carrier gas by means of gas flow through a mass transfer device 10. Carrier gas is equilibrated with hydrogen from the water within a gas equilibration volume 4 and is then circulated, by means of a pump 1, through a circuit 14 that includes a moisture removal component 16, an oxygen removal component 15 and a heated carbon monoxide and sulfur compound removal component 17, which remove water, oxygen, carbon monoxide and sulfur compounds from the carrier gas without consuming or producing hydrogen. A sensor 7 measures the amount of hydrogen in the carrier gas from which moisture, oxygen, carbon monoxide and sulfur compounds have been removed.